



**National
Tribology
Services**

and

BENTLY®
Nevada

Since our inception, Bently Nevada has recognized that a fundamental principle of machinery management and protection was to go right to the source and make a direct measurement. We exemplified this philosophy with our pioneering use of the proximity probe to make direct radial vibration and axial position readings. As our presence in the machinery monitoring arena continued to grow, it became evident that additional direct measurements on a machine allowed more accurate assessment and monitoring of its condition. Temperature, vibration phase, electrical power, and valve position are just a few of the numerous examples that can be cited.

Today, it is increasingly apparent that one of those measurements must include the machine's lubricant, via laboratory analysis at regular intervals. Proper lubrication monitoring has continued to gain acceptance as one of the most important contributions to improve machinery performance and reliability. Obviously, all the vibration monitoring in the world cannot detect degradation of the lubricant itself – at least not until it has degraded so severely that it has resulted in physical damage to the machinery. Lubricant analysis can directly detect signs of abnormal wear conditions, the presence of aqueous contamination in the lubricant, the advancing stages of lubricant oxidation, and many other indicators of problems in the lubricant, the machine, or both. Therefore, we believe the best approach to a comprehensive machine condition monitoring program is the application of vibration measurements in combination with other proven technologies, including lubricant analysis.



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In the spring of 1999, Bently Nevada began taking steps to obtain lubrication service and analysis capabilities to provide customers with the same level of expertise that they had come to expect from our vibration services. This led to the formation of our Lubrication Services group, the development of Bently LUBE™ software, and a very close working relationship with National Tribology Services, Inc. (NTS).

NTS is an independent laboratory located in Peabody, Massachusetts, near Boston's high-tech belt. A customer-focused oil analysis lab, NTS emphasizes a predictive maintenance philosophy based on condition monitoring – not only of the lubricant, but also of the machine itself. They have over a decade of experience satisfying a diverse customer base similar to that served by Bently Nevada. Combining the latest technology and instrumentation with a wide variety of techniques and methodologies, they provide routine and customized testing for a broad range of industrial machinery, including turbines, compressors, gear systems, engines, and hydraulic systems. Their services are aimed at equipment typically found in the power utilities, petrochemicals, pharmaceutical, pulp and paper, and metals processing industries – the very industries served by Bently Nevada.

The founders of NTS have been setting new standards for condition monitoring oil analysis since the 1970s and 80s, when they led a team that developed and applied ferrography to military oil analysis. Over the course of the next several years, it became obvious that spectrometric oil analysis failed to identify large particles, the presence of which are indicative of an abnormal wear situation. To address this, a method called Rotrode Filter Spectroscopy (RFS) was developed for the identification of large wear particles in used lubricant.

NTS was the first laboratory to commercially apply the RFS technique. Combining RFS with traditional spectroscopy (for fine metals and oil additives) provides an excellent screening approach for the detection of all wear particles, ferrous and non-ferrous, large and small. NTS calls this method DOUBLECHECKSM, and if it detects that a severe wear mode is occurring, additional testing is performed to identify the root cause of the problem.

The laboratory personnel at NTS are comprised of engineers, chemists, and laboratory technicians, with degrees in mechanical, materials, and metallurgical engineering, as well as expertise in environmental and organic chemistry.

NTS is firmly committed to quality assurance. The lab is currently certified to ISO 9002 and compliant with ISO/IEC Guide 25 and 10 CFR 50 App. B (Nuclear Power Quality Assurance) standards. The lab participates in the ASTM ILCP (Inter Laboratory Crosscheck Program), as well as other round-robin programs.

NTS offers two-day training courses designed for all personnel involved with lubrication and machine condition monitoring. The courses are held on-site at the NTS labs, with the goal of making the classroom an extension of the lab. Emphasis is placed on lubricant testing methodologies for contamination, lubricant condition, and machine condition. The ultimate goal is to gain an understanding of ways to prolong equipment life, extend oil-drain intervals, and predict equipment failure.

Using the latest technology and innovative approaches to lubricant condition analysis, NTS tests samples quickly and accurately, and reports results via a variety of media, especially electronic formats (including e-mail). With their quick response capabilities and competitive pricing, NTS competes globally for lubricant condition analysis services and has customers on five continents.

Bently Nevada is pleased to use NTS as our lab of choice, and we highly recommend it to our customers. To learn more about NTS, obtain laboratory testing protocols for your specific equipment or application, or access resources related to lubricant condition monitoring, please visit their website at www.natrib.com. ORBIT